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ABSTRACT

This document supplements ED 025 264, a study of 2,459 individuals enrolled in one of 43 occupation-centered curricula in 20 California junior colleges. The parent study compared students' questionnaire responses about home and educational backgrounds, and about attitudes presumably related to both vocational choice and choice of curricula leading to the selected occupations. In this supplement, the relationships between responses to selected questionnaire items and scores on the Interest Assessment Scales (IAS) and Omnibus Personality Inventory (OPI) are the primary concern. These relationships are displayed in 30 tables and show that: (1) a widespread difference in age exists among students in various curricula; (2) the IAS was more effective than the School and College Ability Test in classifying subjects according to their choice of curriculum; (3) IAS and OPI correctly classified the following percentages of students according to: perceived high school achievement (IAS-28 per cent, OPI-30 per cent); job risk preference (IAS-40 per cent, OPI-44 per cent); and highest source of life satisfaction (IAS-18 per cent, OPI-24 per cent); and (4) a comparison of IAS and OPI scores of currently enrolled students and graduates who take jobs closely related to their junior college training indicates that the two groups are similar in interest scores. (JO)

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SUPPLEMENTAL REPORT

This report is supplemental to the report dated June 1968 and entitled "A Study of Certain Characteristics of Students and Graduates of Occupation-centered Curricula" which was submitted and approved as fulfilling requirements for:

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February 1969

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While the analyses in this supplemental report were completed and were based, in part, on data collected after the above mentioned final report was submitted and approved as fulfilling the conditions of the contract, they were made possible by the support from the Office of Education, U.S. Department of Health, Education and Welfare. Individuals conducting research under Government sponsorship are encouraged to express freely their professional judgment. Points of view do not, therefore, necessarily represent Official office of Education position of policy.

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In July 1968, a final report entitled "A Study of Selected Characteristics of Junior College Students Enrolled in Occupational-Oriented Curricula" was submitted to the U.S. Office of Education.* The analyses presented in this document are supplemental to those described in that report. Specifically, the purposes of this supplement are:

a. to extend the analyses presented in the final report,

b. to examine relationships of interest and personality variables to certain background and attitudinal data, and

c. to present additional data not available at the time the final report was prepared.

As described in the forementioned report, the basic study sample consisted of 2,459 individuals who, during the spring and fall of 1966, were enrolled in one of 43 occupation-centered curricula in 20 California junior colleges. Of these, 1,777 were identified as male,; 682 as female. Subjects included in the study were those who had presented usable scores on the Interest Assessment Scales (IAS) and the Omnibus Personality Inventory (OPI). (Both of these instruments were described in the final report). Subjects also completed a brief questionnaire designed to elicit information about home and educational backgrounds and about attitudes presumable related to vocational choices and to choice of curricula leading to the selected occupations.

For the final report only gross tabulations were made of the responses to questionaire items. In this supplement, the relationships between responses to selected items and scores on the IAS and OPI will be of primary concern.

Occasionally, responses to questionnaire items were omitted or could not be coded. Therefore the N's will vary with the respective analysis described in this supplement. Information concerning academic ability was obtained from student records. The fact that a number of these records were incomplete will also account for some of the differences in N's noted in several tables.

AGE

One variable not analyzed in the final report was the age of the subjects in the various curricula. Data relative to this

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variable are shown in Table 1. Note that there is considerable variation ranging from a mean of 19 years for those in forestry to a mean of over 32 years for those in dry cleaning. The spread of ages within each curriculum varies greatly. The standard deviation of ages is slightly over 1 year for forestry students; 12 years for those in dry cleaning. Statistically the observed differences in age are highly significant. It would appear that some of the cirricula serve primarily to prepare individuals for initial entry to an occupation; others, as indicated by the advanced average age of the students, serve more of a retraining function.

SCAT Scores

In the final report School and College Ability Test (SCAT) scores, plus, in some instances, scores from similar tests converted to SCAT equivalents, were grouped according to an a priori clustering or grouping of the 43 curricula. (See Appendix A) The scores represented in the respective clusters were then analyzed by means of multivariate analyses of variance. There were highly significant differences in mean SCAT scores among the clusters. Also, the F-ratio for the variance-covariance matrice was significant indicating possible differences among the clusters in factor structure underlying the ability scores.

The above analysis was extended by subjecting the scores of 841 subjects who actually completed the SCAT and who were grouped into the a priori clusters, to stepwise discriminant procedures. As shown in Table 2, the percent of these subjects correctly classified by means of SCAT scores varied from zero in Cluster I to 50 in Cluster II. Overall clusters, 29 percent of the subjects were correctly classified. This percentage is considerably lower than the 37 percent obtained by means of the IAS with the same clustering of curricula. (See final report.) That is, the interest test was relatively more effective in classifying subjects according to their choice of curriculum.

The verbal score is the more effective discriminator among the seven clusters. (Table 3) It accounted for 16 percent of the dispersion matrix.[1] The quantitative score on the other hand accounted only for an additional nine percent. The total score cannot be included in this analysis since it consists of a sum of the other two scores.

Relationship of Interest and Personality Scores to Responses of Selected Questionnaire Items

On the questionnaire subjects were asked to indicate the nature of their high school achievement by checking the quarter of

[1]. As explained in the final report, the quantity (1 - U Statistic) indicates the amount of the dispersion matrix accounted for by a given variable or by an accumulation of variables.

TABLE 1

Distribution of Age by Curriculum Group

Curriculum	Number of Subjects	Mean	Standard Deviation
Dental assistant	60	19.7	4.7
Secretarial	107	19.7	4.4
Dental hygienist	27	22.0	4.2
Fashion arts	65	23.6	9.3
Food preparation	56	23.6	8.1
Nursing, registered	51	26.4	9.3
Medical assistant	72	25.8	9.9
Cosmetology	108	22.2	7.8
Dry cleaning	24	32.6	12.0
X-ray technology	44	21.5	4.6
Nursing, vocational	69	29.9	11.5
Policeman	70	20.1	3.1
Fireman	17	19.2	1.6
Air conditioning	75	24.6	6.0
Building construction	53	19.3	1.9
Carpentry	48	21.4	4.1
Welding	52	24.8	6.3
Drafting, architectural	63	20.8	4.4
Printing and publishing	51	19.3	3.8
Sheetmetal	46	19.9	3.8
Radio and TV repair	21	26.2	11.5
Dental technology	46	25.4	10.2

TABLE 1 (Cont.)

Accounting	36	20.9	3.4
Electronics technology	117	20.5	3.6
Business administration	55	22.3	5.4
Communications	31	20.4	4.0
Plastics technology	15	27.1	7.9
Data processing	71	22.4	6.4
Photography	39	22.3	5.9
Chemical technology	33	20.2	1.9
Business equipment technology	30	31.5	11.6
Machinist	87	21.6	5.4
Aircraft mechanic, power	50	21.6	5.4
Auto body	60	20.4	4.0
Engineering, civil	50	20.2	2.7
Diesel	84	21.7	5.0
Drafting, industrial	101	19.6	2.1
Aeronautics	45	20.4	2.6
Electrical technology	70	21.7	4.8
Auto mechanic	120	19.8	2.8
Aircraft mechanic, airframe	53	21.6	4.8
Forestry	21	19.0	1.1
Cabinet making	65	22.3	5.8

TABLE 2

Percentage of Cases Correctly Classified
by SCAT Scores Using A Priori Groups

Cluster	Total Number of Cases	Number of Cases Classified	Percentage of Cases Classified
I	21	0	0
II	78	39	50
III	175	73	42
IV	195	13	7
V	257	96	37
VI	100	21	21
VII	15	5	33

Total Classified 247
Total Percent Classified 29

TABLE 3

Summary of Stepwise Discriminant Analyses
of the SCAT Scores Among A Priori Clusters

Variable	F-Value	U-Statistic
Verbal	25.6	.84
Quantitative	16.6	.75

the class in which they thought they had been located. Their OPI and IAS scores, grouped according to their perceived class standing, were then analyzed by means of stepwise multiple discriminant analysis and by multivariate analysis of variance.

Findings relative to the IAS scores are shown in Table 4 through 6. According to Table 4, 28 percent of the subjects were correctly classified by the interest scores into the indicated fourth of the class. But the specified IAS scales were relatively ineffective in accounting for the dispersion matrix (Table 5). The first four scales accounted for only five percent.[1]

The result of the multivariate analysis of variance, Table 6, indicate significant differences for H_2, the test for differences in vectors or profiles of mean scores. It is also apparent that the test for H_1 is significant - raising the question as to possible differences in factor structure underlying the response of the various criterion groups.[2] The relationship between perceived high school achievement and interest scores is interesting in view of the correlations established by countless investigators between grades and academic ability as measured by instruments such as the SCAT. Yet previous research with the IAS has shown the sources to be relatively independent of such measures of ability.[3]

The results of the discriminant analyses of OPI scores are shown in Table 7 and 8. The OPI scores correctly classified 30 persent of all the subjects with respect to perceived class standing. As with the IAS specific OPI scales account for a relatively small proportion of the total dispersion matrix.

According to the results of the multivariate analysis of variance shown in Table 9, the profiles or vectors of mean OPI scores were significantly different. Also the F-ratio H_1 was significant beyond the .01 level again indicating possible differences in the factor structure underlying the scores of the four perceived achievement groups.

[1] In the discriminant analysis only contribution of the first four scales is indicated because typically they are the only ones accounting for a significant amount of the dispersion.

[2] H_1 provides a test for the equality of variance-covariance matrices. A significant F ratio would probably mean that the eigenvalues are different for the several groups.

[3] e.g. L. H. Stewart, and R. R. Ronning, Multidimensional Analysis of an experimental measure of interest. Report Cooperative Research Project 2204, U.S. Office of Education, 1964.

TABLE 4

Percentage of Cases Correctly Classified by IAS Scores Grouped According to Perceived Academic Standing in High School

Group	Total Number of Cases	Number of Cases Classified	Percentage of Cases Classified
Top Quarter	342	180	53
Second Quarter	1093	169	15
Third Quarter	847	274	32
Bottom Quarter	89	30	34
		Total Classified	653
		Total Percent Classified	28

TABLE 5

Summary of Stepwise Discriminant Analyses of IAS Scores Grouped According to Perceived Academic Standing in High School.

Variable	F-Value	U-Statistic
Written Expression	13.4	.98
Adventure	11.0	.97
Abstract Ideas	7.7	.96
Concrete Means	6.9	.95

TABLE 6

Multivariate Analyses of Variance of IAS Scores of Junior College Subjects According to Perceived Academic Standing in High School.

Group	Adv	Ord	Infl	Nurt	Conc	Writ Exp	Abst	Aes
Top Quarter	50.5	40.1	47.3	51.7	51.9	37.7	50.6	49.6
Second Quarter	53.5	39.7	44.8	48.2	53.9	33.9	46.5	46.2
Third Quarter	55.0	39.7	43.7	46.8	54.8	32.4	46.1	46.1
Bottom Quarter	57.4	40.3	45.8	47.5	56.7	34.1	49.9	43.2

Test for H_1 F 1.68 df 108, ∞ P $<$ 01

Test for H_2 F 6.38 df 24, ∞ P $<$ 01

TABLE 7

Percentage of Cases Correctly Classified by OPI Scores Grouped According to Perceived Academic Standing in High School.

Group	Total Number of Cases	Number of Cases Classified	Percentage of Cases Classified
Top Quarter	342	184	54
Second Quarter	1092	180	16
Third Quarter	847	317	37
Bottom Quarter	89	31	35

Total Classified	712
Total Percent Classified	30

TABLE 8

Summary of Stepwise Discriminant Analyses of OPI Scores
Grouped According to Perceived Level of High School Achievement

Variable	F-Value	U-Statistic
Thinking Introversion	43.2	.95
Impulse Expression	9.7	.94
Social Introversion	9.9	.92
Autonomy	7.3	.92

TABLE 9

Multivariate Analyses of Variance of OPI Junior College Scores Grouped According to Perceived Academic Standing in High School.

	Au	Co	ES	IE	SI	TI	TO
Top Quarter	20.4	11.2	10.4	22.0	16.8	32.0	17.6
Second Quarter	18.5	11.3	8.9	23.3	18.5	27.4	16.0
Third Quarter	17.8	11.6	8.6	24.0	19.7	25.8	15.8
Bottom Quarter	19.1	12.5	8.9	25.7	20.8	28.1	17.2

Test for H_1 F 1.83 df $72, \infty$ $P < .01$

Test for H_2 F 8.46 df $16, \infty$ $P < .01$

A second item from the questionnaire selected for analysis concerned the preferences for certain degrees of risk involved in choice of job. Subjects were asked to indicate whether they preferred: --a job which doesn't pay much money but which they were sure of keeping (low risk), --a job which pays good money but which they have a 50-50 chance of keeping (moderate risk), or --a job which pays good money, but one in which chances of failure are high (high risk).

Results of the stepwise discriminant analysis of IAS scores, classified by risk preference are shown in Table 10 and 11. Forty percent of the subjects over all were correctly classified into their respective risk-preference group. However, the four most effective scales, Abstract, Ideas, Nurturance, Influencing Others, and Order, accounted for only six percent of the total dispersion.

As indicated by the multivariate analysis of variance, the profiles of mean IAS scores of the preference groups were significantly different (Table 12). The low risk preference subjects tended to be relatively low on Adventure, Influencing Others, and Concrete; relatively high on Nurturance. By contrast, the high-risk preference group tended to be higher on the Adventure, Influence, Concrete and Abstract scales. The F-ratio for H_1 was not statistically significant. Therefore, it seems safe to conclude that the factor structure of the IAS scales is similar for these criterion groups.

The stepwise discriminant analyses for the OPI scores are shown in Tables 13 and 14. Over all 44 percent of the subjects were classified into their respective risk preference group by means of the OPI scores. However, the four most important scales, Autonomy, Theoretical Orientation, Impulse Expression, and Complexity accounted for only nine percent of the dispersion matrix.

The multivariate analysis of variance, presented in Table 15, show that the three risk preference groups differed significantly in vectors of mean OPI scores. The high risk preference group tended to have relatively higher scores on all scales except for social introversion. As with the IAS, F-ratio for H_1 was not statistically significant.

Finally, subjects were requested to indicate in order of importance three sources of life satisfaction of importance to them. Only the source checked as most important was selected for the following analysis. Five possible choices of those available to the subjects - occupation, money, marriage, leisure and religion - had been checked by sufficiently large N's to justify inclusion in the analysis.

The results of the stepwise discriminant analysis of IAS scores grouped according to these five sources of satisfaction

TABLE 10

Percentage of Cases Correctly Classified by IAS
Scores Grouped According to Risk Preference

Cluster	Total Number of Cases	Number of Cases Classified	Percent of Cases Classified
Low	853	454	53
Moderate	888	135	15
High	664	385	58

Total Number Classified 974
Total Percent Classified 40

TABLE 11

Summary of Stepwise Multiple Discriminatory Analysis
of IAS Scores Grouped According to Risk Preference

Variable	F-Value	U-Statistic
Abstract Ideas	32.8	.97
Nurturance	21.5	.96
Influencing Others	13.6	.95
Order	10.8	.94

TABLE 12

Multivariate Analysis of Variance of IAS Scores
of Subjects Grouped According to Risk Preference

Scale	Low	Moderate	High
Adv	52.7	53.6	55.5
Ord	40.6	39.4	39.4
Infl	43.5	44.4	47.1
Nurt	49.7	47.9	46.4
Concrete	52.8	53.7	56.0
Writ Exp	33.4	34.0	34.8
Abtr	45.0	46.9	50.2
Aes	46.3	46.1	47.6

Test for H_1 F 1.20 df 56,∞ P > 05

Test for H_2 F 11.84 df 14,∞ P < 05

TABLE 13

Percentage of Cases Correctly Classified by
OPI Scores Grouped According to Risk Preference

Cluster	Total Number of Cases	Number of Cases Classified	Percent of Cases Classified
Low	853	466	55
Moderate	888	273	31
High	664	324	49
	Total Number Classified		1063
	Total Percent Classified		44

TABLE 14

Summary of Stepwise Multiple Discriminatory Analysis
of OPI Scores Grouped According to Risk Preference

Variable	F-Value	U-Statistic
Autonomy	58.1	.95
Theoretical Orientation	31.7	.93
Impulse Expression	23.1	.91
Complexity	7.5	.91

TABLE 15

Multivariate Analysis of Variance of OPI Scores
of Subjects Grouped According to Risk Preference

Scale	Low	Moderate	High
Au	16.7	19.4	19.7
Co	10.9	11.2	12.5
ES	8.6	8.9	9.5
IE	22.2	23.2	25.4
SI	19.4	18.9	18.2
TI	25.9	27.6	29.6
TO	15.2	16.3	17.6

Test for H_1 F 1.25 df $56,\infty$ $P > .05$

Test for H_2 F 18.41 df $14,\infty$ $P < .01$

are shown in Tables 16 and 17. Only 18 percent of the subjects over all were correctly classified. The four most important scales, nurturance, order, adventure, and concrete means accounted for 10 percent of the dispersion matrix.

According to multivariate analysis of variance, the vectors of mean IAS scores for the five criterion groups were significantly different. The nature of the differences can be observed by pursuing Table 18. For example, subjects expecting to receive their greatest life satisfactions from leisure activities tended to have high scores on adventure; low on Written Expression. The F-ratio for H_1 was significant, again indicating possible differences in factor structure underlying the scores of these criterion groups.

The results of the stepwise discriminant analysis for OPI scores, grouped according to source of life satisfaction are shown in Tables 19 and 20. Overall, 24 percent of the subjects were correctly classified. The four most effectively discriminating scales, Impulse Expression, Social Introversion, Autonomy, and Theoretical Orientation accounted for a total of 11 percent of the dispersion matrix.

The vectors of mean OPI scores were significantly different (Table 21). Also the F-ratio for H_1 was significant beyond the .01 level which would suggest that perhaps the OPI items provided different stimuli for the criterion groups.

Throughout the analyses presented in the final report, the IAS was consistently more effective than the OPI in classifying subjects with respect to curriculum choice. It is interesting to note that with analyses involving questionnaire items, the two instruments are about equally effective in classifying subjects as to attitudes presumably important in the choice process.

Graduates vs Students

In designing the original project the problem arose as to possible differences between currently enrolled students and graduates who actually enter jobs related to their junior college training. If in fact characteristics of students were markedly different from those who actually enter appropriate jobs, then the results based largely on student populations would be of limited value in making long range predictions. In the final report comparisons were made between a sample of 269 appropriately employed graduates and a random sample of 269 students currently enrolled in curricula relevant to jobs held by the graduates. The analysis of the IAS and OPI scores presented seemed to indicate that the two groups were quite similar with respect to interest scores. There were statistically significant but slight differences on the

TABLE 16

Percentage Correctly Classified by IAS Scores Grouped According to Expected Source of Life Satisfaction

Group	Number	Number Classified	Percent Classified
Occupation	657	192	29
Money	205	73	36
Marriage	1250	69	6
Leisure	129	52	40
Religion	82	42	51

Total Number Classified	428
Percent Classified	18

TABLE 17

Summary of Discriminant Analysis of IAS Scores Grouped According to Expected Source of Life Satisfaction

Step	Variable	F-Value	U-Statistic
1	Nurturance	36.3	.94
2	Order	10.2	.92
3	Adventure	7.2	.91
4	Concrete Means	5.8	.90

TABLE 18

Multivariate Analysis of Variance of IAS Scores Grouped According to Expected Source of Life Satisfaction

Group	Adv	Ord	Infl	Nurt	Conc	Writ Exp	Abst	Aes
Occupation	53.9	41.0	44.9	45.8	56.5	32.6	47.7	45.2
Money	55.5	38.4	44.8	42.5	53.3	31.6	44.9	44.6
Marriage	53.0	39.7	45.0	50.5	52.8	34.8	46.7	47.2
Leisure	59.1	36.7	41.5	43.2	56.3	31.0	46.7	46.6
Religion	51.8	41.0	46.5	53.6	51.5	37.8	48.2	46.5

Test for H_1 F 1.71 df $144, \infty$ P $< .01$

Test for H_2 F 8.16 df $32, \infty$ P $< .01$

TABLE 19

Percentage Correctly Classified by OPI Scores Grouped According to Expected Source of Life Satisfaction

Group	Number	Number Classified	Percent Classified
Occupation	657	102	16
Money	205	73	36
Marriage	1250	304	24
Leisure	129	41	32
Religion	82	40	49

Total Number Classified 560
Percent Classified 24

TABLE 20

Summary of Discriminant Analysis of OPI Scores Grouped According to Expected Source of Life Satisfaction

Step	Variable	F-Value	U-Statistic
1	Impulse Expression	34.3	.94
2	Social Introversion	13.4	.92
3	Autonomy	11.6	.90
4	Theoretical Orientation	6.5	.89

TABLE 21

Multivariate Analysis of Variance of OPI Scores Grouped According to Expected Source of Life Satisfaction

Group	Au	Co	ES	IE	SI	TI	TO
Occupation	17.4	11.5	8.4	24.0	19.6	26.8	4.5
Money	18.2	12.2	8.8	27.0	19.9	25.6	15.9
Marriage	19.1	11.1	9.1	22.4	18.2	27.8	15.9
Leisure	19.7	12.3	8.6	26.2	20.7	25.8	16.8
Religion	16.5	10.3	10.0	18.5	18.1	30.2	15.8

Test for H_1 F 1.57 df 112,∞ P $<$.01

Test for H_2 F 10.87 df 28,∞ P $<$.01

personality scales. Two further analyses are presented in this supplement.

As shown in Table 22, the responses of the graduates and the random sample of students to the questionnaire items were remarkably similar. In only two instances did there appear to be any differences worthy of note. The graduates tended to be somewhat less certain that they will remain in the occupation of their choice and to have chosen their occupation somewhat later than current students. Perhaps the first noted difference was to be expected since the graduate had had actual job experience.

Of the graduates described in the preceding paragraphs, 166 from one college had completed the SCAT. These scores were compared with 166 of subjects enrolled in similar curricula and selected randomly from the comparison group of 269 students. As shown in Table 23, the tests for both H_1 and H_2 were highly significant. Currently enrolled students tended to have somewhat higher verbal and quantitative scores than did the employed graduates. These differences may be explained in part by the fact that a few students enrolled in occupation-centered curricula later transferred to a four-year college or university for more advanced work. Perhaps these transfers represent students with higher ability. Also the differences may reflect changes over a period of years in the basic academic ability of students enrolling in the various curricula. Still another particular explanation may be the sampling problems described in the final report. Identifying names and addresses of employed graduates and obtaining their cooperation with the study were exceedingly difficult tasks.

Perhaps a more meaningful indication of the similarity of graduates and students would be a comparison of subjects from the 1966 sample of 2459 students who subsequent to graduation had entered an occupation related to their training, with a sample of the other students in the same sample. Fortunately a list of 124 "properly employed" graduates was obtained from the placement records of one junior college. The comparison group consisted of the other 276 students who were from the same college and who were enrolled in the same curricula. Thus curriculum and institutional affiliation were constant for the two criterion groups.

The graduates and student samples are described in Table 24. Note that the graduate N's vary slightly because one subject had valid OPI scores but invalid IAS scores.

There is no guarantee that the comparison group did not contain some appropriately employed members. The college could only identify the nature of employment if the job placement was registered with the placement office.

TABLE 22

PERCENTAGES OF RESPONSES TO QUESTIONNAIRE ITEMS

Graduates and Random Sample of California Students

Item	Graduates	Random Sample
1. How good, in general were your high school grades?		
a. top quarter of your class	15	17
b. second quarter of your class	45	45
c. in the third quarter	27	33
d. in the lowest quarter	3	3
2. What is your father's job?		
a. professional	11	9
b. technical, managerial	17	21
c. clerical and sales	11	10
d. service occupations	9	8
e. farming, fishery, forestry	9	6
f. processing occupations	1	1
g. machines trades occupations	9	9
h. bench work occupations	2	1
i. structural work occupations	20	19
j. miscellaneous occupations	8	9
3. What is your mother's job?		
a. professional	11	9
b. technical, managerial	4	4
c. clerical and sales	22	25
d. service occupations	9	9
e. farming, fishery, forestry	.3	0
f. processing occupations	1	1
g. machines trades occupations	2	1
h. bench work occupations	1	1
i. structural work occupations	0	0
j. miscellaneous occupations	51	48
4. Most of my friends (check one):		
a. dropped out of high school	4	4
b. graduated and got a job	30	23
c. entered junior college to learn a trade	10	17
d. entered junior college with plans to transfer to a state college or university	30	32
e. entered military service	6	8
f. entered a four-year college	16	13
g. other	3	3

TABLE 22 (Cont.)

5. How far did your father get in school?

| | | |

TABLE 22 (Cont.)

7.	How sure are you that you will continue in this field?		
	a. very sure	39	52
	b. quite sure	26	30
	c. somewhat sure	6	15
	d. not at all sure	3	1
8.	Suppose that in about 15 years you could make good in whatever job you chose. What job would you choose?		
	a. professional	43	44
	b. technical, managerial	23	26
	c. clerical and sales	4	6
	d. service occupations	5	4
	e. farming, fishery, forestry	1	1
	f. processing occupations	0	1
	g. machines trades occupations	8	8
	h. bench work occupations	0	0
	i. structural work occupations	6	3
	j. miscellaneous occupations	3	3
9.	Please tell as near as you can remember when you decided what field of work to enter.		
	a. before junior high school	7	8
	b. during junior high school	7	9
	c. during senior high school	37	52
	d. in junior college	39	23
	e. I have not yet decided	6	5
	f. other	3	2
10.	If you had your choice, which of the following kinds of jobs would you pick?		
	a. a job which doesn't pay much money but which you were sure of keeping	29	32
	b. a job which pays good money but which you have a 50-50 chance of not being able to hold down.	42	42
	c. a job which pays real good money if you can keep it, but one in which chances of failure are high.	26	23

TABLE 22 (Cont.)

11.	If you were back in high school now, what would you do differently?		
	a. take a college preparatory program	33	32
	b. take a vocational program	10	16
	c. take a business program	8	14
	d. take a general program	4	7
	e. study harder or get help on study problems	58	57
	f. learn more about chances for certain jobs	25	30
	g. ask help from teachers or counselors with my problems	26	25
	h. choose different friends	11	6
	i. take more active part in out-of-class activities	25	35
	j. take less active part in out-of-class activities	4	3
	k. take different subjects in same program	11	16
	l. take high school more seriously	51	49
	m. would not do anything different	9	12
	n. other	7	9
12.	What <u>three</u> activities in your life do you expect to give you the most satisfaction? Please write a "1" next to the <u>most</u> important; a "2" next to the <u>second most</u> important; "3" next to the <u>third most</u> important; place a "0" next to the <u>least</u> important.		
	a. occupation or job		
	"1"	22	25
	"2"	40	33
	"3"	16	18
	"4"	2	1
	b. making money		
	"1"	4	8
	"2"	14	17
	"3"	21	18
	"4"	6	7
	c. marriage and family life		
	"1"	60	53
	"2"	18	19
	"3"	8	13
	"4"	1	3
	d. leisure time play activities: hobbies, outdoor living, sports		
	"1"	6	5
	"2"	14	13
	"3"	30	22
	"4"	3	6

TABLE 22 (Cont.)

e. religious activities		
"1"	3	5
"2"	7	6
"3"	6	11
"4"	17	7
f. taking part in affairs of your community		
"1"	1	0
"2"	3	2
"3"	3	4
"4"	10	6
g. taking part in activities directed toward making world conditions better		
"1"	1	1
"2"	1	3
"3"	4	3
"4"	10	10
h. literature, art, or music		
"1"	1	.3
"2"	3	3
"3"	9	6
"4"	18	17
i. other		
"1"	1	.3
"2"	1	2
"3"	1	1
"4"	2	3

13. Before each of the following vocations put the number that tells what you as a high school senior, thought were your chances of success in that vocation.

a. skilled craftsman (carpenter, painter, mechanic, etc.)		
1. no chance	25	20
2. slight chance	10	10
3. fair chance	23	29
4. very good chance	37	36
b. managerial (business position, etc.)		
1. no chance	17	14
2. slight chance	27	29
3. fair chance	40	37
4. very good chance	16	14

TABLE 22 (Cont.)

c.	unskilled laborer		
	1. no chance	46	38
	2. slight chance	12	15
	3. fair chance	8	11
	4. very good chance	23	28
d.	high-level professional (doctor, lawyer, etc.)		
	1. no chance	36	34
	2. slight chance	39	36
	3. fair chance	20	15
	4. very good chance	6	11
e.	service (domestic, railroad porter, etc.)		
	1. no chance	43	30
	2. slight chance	18	26
	3. fair chance	10	19
	4. very good chance	13	16
f.	athlete (ball player, etc.)		
	1. no chance	56	43
	2. slight chance	16	27
	3. fair chance	13	17
	4. very good chance	4	7
g.	semiskilled worker (assembly-line worker, etc.)		
	1. no chance	21	13
	2. slight chance	25	23
	3. fair chance	20	32
	4. very good chance	24	27
h.	white-collar worker (sales clerk, etc.)		
	1. no chance	12	11
	2. slight chance	19	16
	3. fair chance	34	36
	4. very good chance	28	30

14. As a high school senior, what did you think your chances of success were in the following types of schools?

a.	junior college with idea of changing later to 4-year college or university		
	1. no chance	10	4
	2. slight chance	16	14
	3. fair chance	32	40
	4. very good chance	33	35
b.	junior college (job program)		
	1. no chance	6	1
	2. slight chance	6	6
	3. fair chance	18	28
	4. very good chance	58	58

TABLE 22 (Cont.)

c. state college		
1. no chance	12	11
2. slight chance	30	29
3. fair chance	33	38
4. very good chance	16	15
d. University of California		
1. no chance	39	44
2. slight chance	29	31
3. fair chance	16	15
4. very good chance	4	4
e. private college or university		
1. no chance	46	45
2. slight chance	23	25
3. fair chance	16	15
4. very good chance	5	7

TABLE 23

Multivariant Analysis of SCAT Scores-
Graduate and Random Samples

Grads N 166		Random N 166	
M	SD	M	SD
27.1	10.1	29.2	10.3
26.5	10.3	29.5	9.5
53.5	16.4	59.0	16.5

Test for H_1	F 38.5	df 6, ∞	P $<$ .01
Test for H_2	F 3.6	df 3, 328	P $<$ .01

TABLE 24

Appropriately Employed Laney Graduates and a Comparison Group Used in Analysis of IAS and OPI Scores - Both from 1966 Sample.

Curriculum	Graduates	Comparison Group
Air conditioning - refrigeration	4	14
Electrical technology	2	12
Air frame mechanics	2	7
Auto mechanic	4	6
Business equipment technology	11	18
Carpentry	4	5
Cosmetology	6	11
Dental assistant	13	11
Diesel mechanic	4	15
Architectural drafting	4	27
Drafting	5	12
Dry cleaning	6	9
Electronics	8	61
Fashion arts	6	28
Machinist	5	16
Photography	2	2
Printing - graphic arts	11	13
Sheet metal	18 (17 IAS)	1
Upholstery	4	4
Welding	5	4
Total	124 (123 IAS)	276

Multivariate analysis of variance of the IAS scores indicated that the appropriately employed graduates did not differ significantly from the comparison group (Table 25). Neither the F-ratio for H_1 and H_2 reached the .05 level of significance. As can be seen in Table 26, the two groups were similar with respect to the OPI scores. Again the F-ratios for H_1 and H_2 were insignificant.

Since SCAT scores were not available for all subjects the appropriately employed graduate and comparison samples were reduced as shown in Table 27. According to multivariate analysis of variance, mean SCAT scores of the two groups were quite similar. However, the F-ratio for H_1 is significant. There appears to be no logical reason why this should occur. Therefore, this writer is inclined to discount it. Nevertheless it should be remembered that in the analysis reported earlier, similar differences for H_1 were observed.

On the whole, the evidence presented in this supplement along with that presented in the final report indicated that the students and appropriately employed graduates tended to be quite similar with respect to interests, personality variables, and certain background factors, thus adding considerable weight to the results based only on students.

Proposed Application of Findings of the Study

As suggested in the final report, the major importance of the findings of study may lie in their contribution to the theory of occupational choice. However, on further reflection, the procedure used in the study and the findings may be immediately useful.

Currently, there is a great deal of interest in programming guidance information such as test scores and the like so that it can be disseminated to students through the use of computers. Computerized guidance information supplemented by individual counseling would have certain obvious advantages over the efforts of school counselors. Present case loads, for example, permit insufficient time for adequate work with all students either on an individual or group basis. However, the use of computers can be seriously limited because of inadequacies in the data available to programmers. The lack of meaningful data concerning characteristics of students preparing for technical and subprofessional level occupations is especially apparent.

Perhaps the type of data provided in the final report could serve as an initial core of information to be included in the program. The system might work as follows:

Assume a high school student is interested in becoming a

TABLE 25

Multivariate Analysis of Variance of IAS Scores of Laney College Graduates Placed in Their Field of Study vs. Laney College Comparison Group

	Graduates	Comparison Group
Adventure	52.1	54.2
Order	38.5	41.0
Influencing Others	43.0	43.9
Nurturance	46.8	46.2
Concrete Means	55.0	56.5
Written Expression	32.1	34.4
Abstract Ideas	46.8	48.9
Aesthetic	45.2	47.2

Test for H_1 F 1.06 df 36, ∞ $P > .05$

Test for H_2 F 1.61 df 8,390 $P > .05$

TABLE 26

Multivariate Analysis of Variance of OPI Scores of Laney College Graduates Placed in Their Field of Study vs. Laney Comparison Group

	Graduates	Comparison Group
Au	18.5	18.3
Co	11.5	11.8
ES	8.7	8.5
IE	22.7	23.3
SI	20.0	19.9
TI	28.0	27.3
TO	16.6	16.6

Test for H_1	F 1.03	df 28, ∞	P > 05
Test for H_2	F .34	df 7, 392	P > 05

TABLE 27

Appropriately Employed Laney Graduates and Comparison Subjects Used in Analysis of SCAT Scores

Curriculum	Graduates	Comparison Group
Air conditioning - refrigeration	2	13
Electrical technology	1	9
Air frame mechanics	2	6
Auto mechanic	4	5
Business equipment technology	5	16
Carpentry	4	4
Cosmetology	6	9
Dental assistant	12	11
Diesel mechanic	3	10
Architectural drafting	2	25
Drafting	5	12
Dry cleaning	4	8
Electronics	7	59
Fashion arts	5	24
Machinist	5	15
Photography	2	2
Printing - graphic arts	10	12
Sheet metal	18	1
Upholstery	4	3
Welding	2	3
Total	103	247

TABLE 28

Multivariate Analysis of Variance of SCAT Scores of Laney College Graduates Placed in Their Field of Study vs. Laney College Comparison Group

	Graduates	Comparison Group
SCAT Score 1	25.3	25.0
SCAT Score 2	25.8	26.1
SCAT Score 3	31.0	31.0

Test for H1 F 7.02 df 6.0, ∞ P < .01

Test for H2 F .09 df 3.0, 346 P > .05

technician or in working at a subprofessional level. As part of the decision process, he completes an interest inventory--in this case the IAS. When the instrument is scored, the computer could automatically relate the student's profile to the profiles of mean scores of relevant criterion groups. In addition to the customary profiles of scores a subject would receive an indication of the correlation of his profile with the means of the curriculum clusters. Or if greater specialty were required, the subject's profile could be related to each specific curriculum included in the program.

To provide some indication of the practicality of such an approach, a trial run was made using data available from the study described in the final report. The profile or IAS mean score of the five curriculum clusters derived by Tryon's Cluster Analysis and based on the 2459 California subjects (Appendix B) were used as reference or normative scores. As described in the final report these clusters were formed by collapsing the 43 California curriculum groups in terms of Euclidian distance among their means. Idaho students (N306) representing curricula easily grouped with one of the five clusters were used as a test sample. The measure of relationship for each individual was $D = \sum d^2$, where d is the absolute difference between a person's score on an interest scale such as Adventure and the mean of the criterion group on the same scale. The higher the relationship, the smaller the D. If in terms of interests, a subject is correctly placed in a curriculum group, D should tend to be smaller for the cluster to which the subjects belongs than for the four clusters.

As indicated, the first analysis was based on norm groups which included all California subjects classified in their respective curriculum clusters. The results are shown in Table 29 which is read as follows:

Of the 19 Idaho subjects whose curriculum choice placed them in Cluster I and who in the discriminant analysis had been properly classified into his curriculum by IAS scores, 16 or 84 percent had a smaller D's for Cluster I than for any other cluster. Only 8 of 18 subjects who were not properly classified in the original discriminant analysis had the lowest D for Cluster I, etc.

These results are encouraging but note that the number of "hits" is much less in other clusters, varying from 6 percent for Cluster III to 78 for Cluster IV. Why should the percentages of "hits" vary so greatly from cluster to cluster? Perhaps the answer lies in part in the heterogeneity of the clusters. It may well be that the criterion or reference groups need to be quite specific and homogeneous.

A more appropriate procedure for establishing reference

Table 29

Comparison of Idaho Subjects' Scores with Means Taken Over All California Subjects in All Curricula (Tryon Clusters)

Cluster	Number Correctly Classified	Total Number	Percentage Correctly Classified
I			
Properly classified	16	19	84
Improperly classified	8	18	44
II			
Properly classified	12	39	31
Improperly classified	11	32	34
III			
Properly classified	2	33	6
Improperly classified	10	83	12
IV			
Properly classified	7	10	70
Improperly classified	9	24	38
V			
Properly classified	17	30	57
Improperly classified	1	20	5
Total Percentage:	Properly classified		41%
	Improperly classified		21%

points may be to include in the criterion groups only subjects who were themselves properly classified by the IAS scores. This procedure should tend to reduce overlap among the criterion groups. The vectors of means were recomputed using only scores of properly classified subjects from each cluster. To further increase the homogeneity of the criterion of norm groups, only scores of California students representing the same curricula as those in the Idaho sample were included in computing cluster means or comparison scores. Then the analysis described in the previous paragraph was repeated.

The results are shown in Table 30. The percentage of correct hits for Cluster III increased slightly, but it decreased for the other four clusters.

The findings obtained by these two procedures are somewhat puzzling. Why should there be a high number of hits in one or two clusters and a low number in others? Can this be due to systematic differences between California and Idaho students entering certain occupation-oriented curricula? Such an explanation seems unlikely since previous analysis of variance-covariance matrices had shown that the two groups were quite similar with respect to interest scores.

While the above analyses do not yield clearcut results, the outcomes were sufficiently promising to justify further study. More attention needs to be given to the nature of the criterion samples against which to compare subject's scores. Obviously it would not be feasible to use the interest scores of subjects in single occupations as reference points. The number of possible comparisons simply would be so large as to require a computer to interpret the output. Some method of grouping occupations must be used. Perhaps the Tryon, the clustering procedure described in the final report, will prove to be quite adequate. The number of subjects in each criterion will need to be increased and expanded in coverage to include subjects outside California.

Still another type of refinement not yet incorporated in the proposed schemes for "fitting" a subject's profile of scores with those of several norm groups, would be to include the variance of scores for the several criterion groups. That is, instead of computing a deviation from the mean, consider it a deviation only if it exceeds a confidence interval of, say plus and minus one standard deviation. This procedure probably would have the net effect of reducing the number of "hits", but at the same time one could have more confidence in the reliability of observed differences in D.

Table 30

Comparison of Idaho Subjects' Scores with Means Taken Over Scores of Properly Classified California Subjects in Curricula to Match Idaho Curricula (Tryon Clusters)

Cluster	Number Correctly Classified	Total Number	Percentage Correctly Classified
I			
Properly classified	15	19	79
Improperly classified	10	18	56
II			
Properly classified	6	39	15
Improperly classified	4	32	12
III			
Properly classified	4	33	12
Improperly classified	8	83	10
IV			
Properly classified	6	10	60
Improperly classified	5	24	21
V			
Properly classified	14	30	47
Improperly classified	9	20	45

Total Percentage of Correctly Classified

Properly classified	34%
Improperly classified	20%

APPENDIX A

A Priori Classification of Curriculum Groups

Cluster I

Forestry
Criminology
Fire Science

Cluster II

Cosmetology
Dry Cleaning
Fashion Arts
Food Preparation/Service

Cluster III

Dental Assisting
Dental Technology
Medical Assisting
Nursing, Registered
Nursing, Vocational
X-Ray Technology
Dental Hygienist

Cluster IV

Air Conditioning
Airpower Mechanic
Airframe Mechanic
Auto Mechanic
Auto Body/Fender
Diesel
Machinist
Sheet Metal
Welding

Cluster V

Aeronautics
Business Equipment Technology
Chemical Technology
Drafting, Architectural
Drafting, Industrial
Electrical Technology
Electronic Technology
Engineering, Civil
Photography
Plastics Technology
Radio-TV Repair

Cluster VI

Accounting/Bookkeeping
Communications
Data Processing
Printing/Publishing
Secretarial
Business Administration

Cluster VII

Building Construction
Cabinet Making
Carpentry

APPENDIX B

Clustering of Curriculum Groups on Basis of IAS Mean Scores--Tryon System

Cluster I - Personal Service

Curriculum
Dental Assistant
Secretarial
Dental Hygienist
Fashion Arts
Food Preparation
Nursing, Registered
Medical Assistant
Cosmetology
Dry Cleaning
X-Ray Technology
Nursing, Vocational

Cluster II - City Service

Policeman
Fireman

Cluster III - Construction

Air Conditioning
Building Construction
Carpentry
Welding
Drafting, Architectural
Printing and Publishing
Sheet Metal
Radio and TV Repair
Dental Technology
Accounting
Electronics Technology

Cluster IV - Business

Business Administration
Communications
Plastics Technology
Data Processing
Photography
Chemical Technology
Business Equipment Tech.

Cluster V - Machines

Machinist
Aircraft Mechanic, Power
Auto Body
Engineering, Civil
Diesel
Drafting, Industrial
Aeronautics
Electrical Tehnology
Auto Mechanic
Aircraft Mechanic, airframe
Forestry
Cabinet Making